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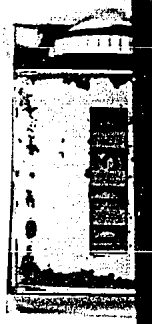


SOVIET ACTIVITIES IN THE ARCTIC AND ANTARCTIC (6)

[Comment: Soviet Activities in the Arctic and Antarctic is a bimonthly report presenting information extracted from Soviet newspapers, periodicals, and books. This report includes information published up to 4 September 1956.

The report covers all Soviet activities in the Arctic and Antarctic with the exception of commercial shipping, which appears in the Summary series Transportation, Communications, Electric Power, and Construction in the USSR.

All temperatures in this report are given in degrees centigrade. Numbers in parentheses refer to appended sources.

This is the final issue of Soviet Activities in the Arctic and Antarctic. It will be replaced by the bimonthly report Activities in the Arctic and Antarctic, which will deal with the same subject matter as the current report but will include information on all nations operating within the polar regions.]

ARCTIC

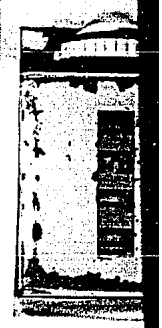
Drift Stations

G. Silin, meteorologist at Severnyy Polyus-5, reported in August that the station geophysicist and astronomer L. Zhigalov had completed 680 series of absolute observations on elements of the earth's magnetism. Zhigalov is taking part in his first polar expedition, having completed formal studies at Leningrad State University just last year.

On 9 August, Silin reported the coordinates of Severnyy Polyus-5 to be 83-54 N and 73-39 E and ocean depths to be averaging 3,400 meters. (1)

On 7 July Severnyy Polyus-4 was just 12-13 kilometers from the geographic pole. The stations's latest observed latitude at this time was 89-53-06 N. (2)

Observations made at Severnyy Polyus-3 in 1954 and 1955 indicate that polar sea ice moves, on the average, at one fiftieth the speed of the wind, and drift direction is 30 degrees to the right of wind direction.



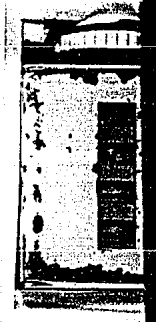
Air temperatures during the drift were as follows:

Year and Month	Temperature (degrees)		
	Mean Monthly	Maximum	Minimum
1954			
April	-19.6	-7.0	-29.0
May	-11.3	-3.0	-21.0
June	-2.0	+1.8	-11.0
July	-0.4	+1.3	-2.9
August	-1.5	+1.0	-9.4
September	-9.5	+0.0	-32.5
October	-14.2	-0.2	-30.9
November	-27.5	-7.4	-38.4
December	-30.4	-11.9	-46.1
1955			
January	-33.7	-20.0	-45.9
February	-34.9	-14.4	-46.0
March	-29.1	-8.5	-45.5

A year's cycle of aerological observations was completed for the first time in the Central Arctic by the staff of Severnyy Polyus-3. Radiosondes were launched twice a day which gathered data on air temperature, pressure, and humidity at different altitudes.

These observations permitted the staff to study the structure of the atmosphere and processes in the lower stratosphere during the passage of various air masses over the Central Arctic. During the winter period, a permanent, sharp temperature inversion was found in the lower layer of the troposphere, sometimes occupying the layer up to 3,000 meters, with air temperatures in the upper part of this layer 15-20 degrees warmer than the temperature at the ice. It was established also that the lower limit of the stratosphere, both in winter and summer, does not decrease in direct proportion to an increase in geographic latitude as was formerly supposed. This lower limit actually varies considerably in relation to the passage of one or another air mass.

During the passage of a cold air mass, the tropopause is lowered, its minimum height being measured at 4,700 meters. With the intrusion of a warm air mass from the Atlantic or Pacific into the Central Arctic, the tropopause rises to a height of 11,000-12,000 meters. This indicates that the lower layer of the stratosphere may vary from year to year and season to season, depending on cyclonic activity in the atmosphere.



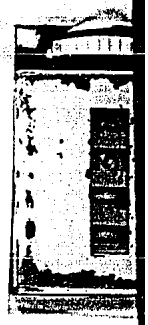
Observations made on solar heat at high latitudes indicate that melting of snow and ice in the spring-summer period results mainly from direct solar radiation. Previous observations on radiation balance in more southerly latitudes led to the belief that the magnitude of radiation balance decreased with an increase in latitude. Direct observations at Severnyy Polyus-3 near the pole, however, indicated that this hypothesis was applicable only up to the 75th parallel. In higher latitudes, the magnitude of the heat balance increased. Observations at Severnyy Polyus-3 showed the heat balance in 1954 and 1955 to be positive, amounting to 8 large calories per square centimeter.

Studies on geology of the ocean bottom were carried out by means of bottom sediment collections and depth measurements. Ordinarily, bottom cores were taken 2-3 times a month, but during periods when depths were changing sharply, they were taken 4-5 times a month. All together, 34 cores were obtained. Since the station crossed the range imeni Lomonosov near the North Pole, soundings made there produced a more detailed picture of the outline of this range, and in addition two spurs were discovered lying 2,580 meters and 2,720 meters below the surface of the ocean. The slope of these spurs appeared to be less severe than the slope of the primary range.

Bottom studies showed that in the deep water depressions lying along the range imeni Lomonosov, the bottom was clay silt, while on the range itself the bottom was sand silt.

Water temperatures recorded at the station were as follows: (3)

	Station in Pacific Depression (88-44N, 205-56E) 2 Aug 54		Station in Atlantic Depression (89-33N, 255-48E) 29 Aug 54	
Depth (meters)	Temperature (degrees)	Salinity (per mill)	Temperature (degrees)	Salinity (per mill)
5	-1.54	30.67	-1.60	30.44
10	-1.55	30.67	-1.61	30.44
25	-1.56	30.73	-1.60	30.46
50	-1.63	31.44	-1.58	31.99
60	-1.53	31.97	-1.54	32.20
75	-1.32	32.22	-1.18	32.58
100	-1.42	32.77	-1.40	33.23
125	-1.44	33.02	-1.32	34.07
150	-1.39	34.10	-0.97	34.28
200	-0.60	34.51	-0.28	34.61
250	-0.06	34.65	+0.82	34.83
300	+0.28	34.76	+0.93	34.87
400	+0.50	34.86	+0.86	34.88



Depth (meters)	Station in Pacific Depression (88-44N, 205-56E) 2 Aug 54		Station in Atlantic Depression (89-33N, 255-48E) 29 Aug 54	
	Temperature (degrees)	Salinity (per mill)	Temperature (degrees)	Salinity (per mill)
500	+0.54	34.87	+0.57	34.89
750	+0.12	34.88	-0.03	34.88
1,000	-0.07	34.88	-0.32	34.90
1,500	-0.34	34.93	-0.54	34.91
2,000	-0.40	34.94	-0.72	34.92
2,500	-0.40	34.94	-0.78	34.92
3,000	-0.37	34.94	-0.79	34.93
3,500	-0.34	34.94	-0.72	34.93
3,900	-0.30	34.94	--	--
4,000	--	--	-0.63	34.95
4,120	--	--	-0.64	34.95

Expedition to Northern Pacific and Bering Sea

For almost 7 months (from the end of April to the beginning of November 1955), an expedition of the Institute of Oceanology, Academy of Sciences USSR, working with the Pacific Ocean Scientific Research Institute of Marine Fish Economy and Oceanography and representatives of many other scientific organizations, operated in the Bering Sea and waters around the Kurile Islands.

The program of the expedition, with hydrologists, geologists, meteorologists, and zoologists participating, included complex studies on the biology and distribution of Cetacea in the southwestern part of the Sea of Okhotsk, the waters around the Kurile Islands, and the central part of the Bering Sea; hydrologic survey and research on plankton distribution in these areas; the distribution of the far eastern dolphin in Kurile Island waters; and the biology of the sea lion (Eumetopias jubata).

The Ministry of Fishing Industry USSR put two small, 680-ton-displacement sail-motor schooners at the disposal of the expedition. One of them, the Krylatka, operated in the waters around the Kurile Islands and in the southwestern part of the Sea of Okhotsk, while the second ship, the Nerpa, worked in the Bering Sea and at the end of the season in Kurile waters also.

During the time of the expedition, the ships covered about 31,500 kilometers altogether. Research was carried out not only at sea, but also at shore bases where whaling ships deliver whales for dismemberment and proscessing. On islands of the Kurile group (Sikotan, Iturup, Simushir, Paramushir) observation points were organized for collecting data on the morphology, feeding, and reproduction of whales encountered in nearby waters. In addition, 45 landings were made on almost all the Kurile Islands for the purpose of studying sea lion rookeries.

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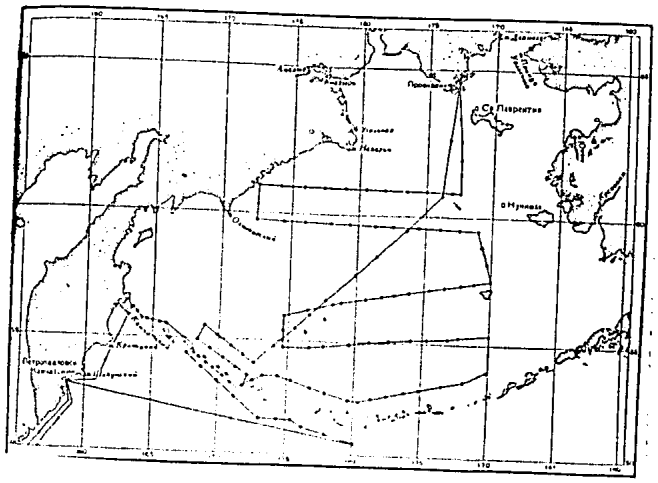
The expeditionary ship Nerpa began hydrologic surveying, plankton gathering, and observations of marine animals from Mys Afrika, rounded the Komandorskiye Ostrova to the north, and entered the Bering Sea. Moving to the north of the Aleutians as far as 170 W, the Nerpa stopped each 30 miles to take water temperature and salinity measurements, to collect plankton samples, and to do other work. After reaching 170 W, the ship turned north about 100 miles and then set its course to the west. Moving further north each time, it subsequently crossed the entire Bering Sea three times more from the Koryakskiy Bereg to the 170th parallel (See chart below.)



Voyage of the Expeditionary Ship
Nerpa in the Bering Sea, 1955.
(Points Indicate Stations)

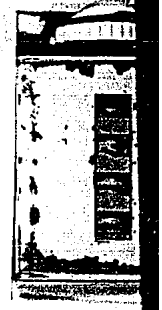
It should be noted that this was the first time complex research had been carried out in the central part of the Bering Sea.

After taking on fuel and fresh water in Bukhta Provideniya, the Nerpa crossed the Bering Sea from north to south, repeating some of the stations obtained earlier for purposes of verification.

In Proliv Blizhniy, a series of observations was carried out on the interchange of waters between the Bering Sea and the Pacific Ocean, after which the ship proceeded into the Pacific.

In the Pacific, the ship sailed along the southern side of the Aleutians as far as 180 E, and then reversed course and returned to Kurile Island waters and carried out research in the southern part of the Sea of Okhotsk.

The material gathered by the Nerpa indicates that there are several rather large fields of plankton in the central part of the Bering Sea and in Kurile Island waters. The main component of these concentrations is Calanus crisatus, the largest of the copepodous crayfish (maximum length up to 5 millimeters).



These serve as food for rorquals (Balaenoptera), many marine birds, pelagic fish, and other forms of life, all of which were observed in large quantities, especially during the three latitudinal crossings of the Bering Sea. Near the Komandorskiye Ostrova and in the waters lying to the north of the Aleutians, many large sperm whales were encountered in the spring moving along the islands to the west in groups of 5-7 and even 10 head. In the autumn, they move in the opposite direction, to the east.

While the sperm whale does not depend directly on plankton for food, the mollusks and fish which it does consume live in turn and are attracted by the plankton concentrations.

The rorquals, on the other hend, do depend directly on plankton for food, and large numbers of these were observed in the waters around the Aleutians and in the central part of the Bering Sea.

A great deal of data were also gathered by the expedition on the finback whale, which was encountered in small groups of 2-3 and sometimes 6 head. Other rorquals, being more warm-water creatures (sei whales, for example) were also encountered, but in smaller numbers and further to the south. In the furthest part of the Bering Sea, the blue whale was encountered. It was the finding of the expedition that the prohibition on hunting of blues established in 1946 by the International Committee on Whaling Regulation was most effective, and in fact the number of the whales has so increased in the northern part of the Bering Sea that the expedition was able to recommend resumption of partial hunting in this area.

In addition to the large whales, the expedition observed small members of the Balaenopteridae, killer whales, dolphins, sea lions, seals, and others.

Throughout the course of the expedition, the ship carried out regular meteorological observations which were relayed to the Kamchatka Observatory and utilized for synoptic maps and weather forecasts. (4)

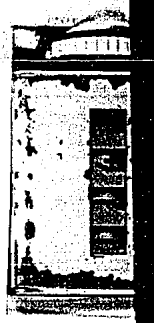
(Note: The second expeditionary ship, the Krylatka, carried out similar research in the southwestern part of the Sea of Okhotsk and in the waters around the Kurile Islands. While this phase of the expedition is outside the scope of this report, it may be noted that the source gives approximately the same data on it as given for the voyage of the Nerpa in the Bering Sea.)

Hydrographic Work in Kolymskiy Zaliv

Basic survey work in the Kolymskiy Zaliv for navigational purposes had not been completed until recently, and as a result there were no charts or sailing directions ensuring safe passage of these waters.

In accordance with provisions of the Sixth Five-Year Plan, therefore, the Hydrographic Administration of Glavsevmorput (Main Administration of the Northern Sea Route) has instructed the Pevek Patrol-Hydrographic Expedition to carry out hydrographic exploration in the Kolymskiy Zaliv.

In the spring, a hydrographic detachment was sent to the mouth of the Kolyma River to carry out studies on bottom relief at the river bar and throughout the Kolymskiy Zaliv, in order to collect data to be employed in making up sailing directions for use by both river and maritime ships.



The group arrived at the Kolyma and began work under difficult conditions, due particularly to the scarcity of transport. The detachment had at its disposal only one S-80 tractor and two dog teams. Under difficult meteorological conditions, with temperatures as low as 38 degrees below zero, the party lived on the ice by the week in ordinary canvas tents while performing difficult work in observing ocean depths from the ice.

Exploring one section of the sea or another, they moved 20-30 kilometers a day on foot. Difficulties were compounded by the absence of geodetic bench marks throughout the area studied, a distance of about 100 kilometers, and work cannot be carried out without these. Working in low air temperatures and during purgas and snowstorms, engineer-hydrographer B. Vul'fovich, technician-hydrographer A. Zboynov, worker V. Khryakov, and others built geodetic bench marks and froze them in the ice. In the final stages of the work, contributions were made by Z. Lipovka, B. Vul'fovich, A. Kostromin, V. Vinogradov, V. Luk-yanov, A. Zboynov, B. Stogov, A. Buldakov, V. Kostyk, A. Vlasov, M. Agafonov, and B. Semenov.

There were certain other factors which inhibited the work of the expedition also, and one of these in particular should be noted. Although the hydrographic expedition has completed basic work on the seas of the Soviet Arctic over a period of many years and the material so gathered has gone into charts and sailing directions, the detachments of the expedition still lack mechanical transport (tractors, cross-country vehicles, helicopters). (5)

Automatic Drift Stations for Arctic Use

Yu. Alekseyev has been highly successful in designing an automatic drift station for use in the Arctic area.

Working with other members of the new technology laboratory of the Arctic Institute, Alekseyev developed the automatic installation currently in use, known as the Alekseyev beacon. In essence, the equipment is a small radio beacon of original design with an adapter which maintains it in a verticle position regardless of the unevenness of the surface on which it is placed.

The equipment is delivered by aircraft to the Arctic Basin, where it is set up on the ice. Left alone, the installation begins to send radio bearings on a definite schedule and on a fixed frequency.

Receiving these signals, observers at shore stations can establish the coordinates of the beacons with sufficient accuracy for plotting their position (within one-half degree), and since these plottings are made continuously, the movement of the beacons and therefore of ice in the central polar basin can be traced.

Continually improving and perfecting the equipment, Alekseyev, B. Felisov (chief of the laboratory), and V. Sarriy (senior engineer) designed a new installation, the DARMS -- drifting, automatic, radiometeorological station. This is also a radio beacon but more highly complex.

Adjusted to one wave length, the DARMS may be called by a shore station at any time desired. Having received a call, the installation transmits its call letters, followed by the information recorded by its meteorological instruments: barometric pressure, air temperature, and wind direction and speed.

One of these beacons was delivered to the Arctic for the first time in the spring of 1952 by Alekseyev and Felisov aboard an aircraft piloted by V. Perov. It was set up on an ice floe in the Taymyr Ice Mass, 250 miles northeast of Mys Chelyuskin. Fundamentally, this beacon operated very well.

Shortly after this, the scope of experimentation was expanded, and several more of the beacons were set up at various points in the Arctic Basin. Like all such work, this was not completed without losses. Some of the beacons broke down and disappeared without a trace, while others operated and continue to operate satisfactorily. One of the beacons, for example, was set up on 8 May 1955 to the northwest of the Novosibirskiye Ostrova, and it continues to operate with no maintenance. Alekseyev beacons have operated for many months without difficulty in the Kara, Taymyr, and Ayon ice masses and in the Central Arctic.

Work is continuing on perfecting and improving the DARMS. It is planned, for example, to equip the installation to transmit information on humidity of the air and even hydrological information -- sea water temperature, speed and direction of currents, and possibly even soundings in the drift area. The level of contemporary electronics development should permit the early attainment of these aims.

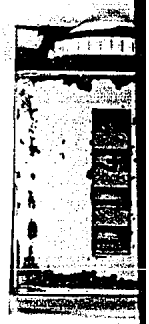
Navigational conditions were extremely difficult this year in the arctic seas. July was unusually cold, and along the entire northern coast of Asia steady northerly winds were observed, although easterly and southerly winds usually prevail during this time of the year.

In the opinion of specialists, the change in wind direction resulted from synoptic processes unusual for the Arctic.

Ordinarily, a high-pressure area is located over the pole of relative inaccessibility during June and July, bringing relatively warm easterly and southeasterly winds to the Soviet arctic seas. This year, however, a low-pressure area was observed, bringing northerly and northwesterly winds. Under the influence of these winds, a massive displacement of pack ice to the south occurred and ice thinned out in the central part of the Arctic Basin. This is easily verified by the movement of the drift stations and the radio beacons. Severnyy Polyus-6 began its drift in the spring at the 75th parallel, north of Ostrov Vrangelya. From April to the beginning of June, it drifted about 200 miles to the northwest, then in June and July it returned to its original location. Severnyy Polyus-5 moved along the drift track of the G[illegible]ly Sedov, reaching 86-50 N, then it too turned to the south and is now located at the 84th parallel, less than 150 miles from Zemlya Frantsa-Iosifa.

The behavior of Severnyy Polyus-4, located in the Canadian sector of the Arctic, was also unusual. The station appeared to be heading to Ellesmere Island or Greenland, but it turned suddenly and returned to the Soviet sector (the eastern hemisphere).

Drift action of the Alekseyev beacons was similar. The beacon set in the Ayon Ice Mass drifted more than 200 miles through the Proliv Longa, passing from the East Siberian Sea to the Chukchee Sea and moving almost 2 degrees of latitude to the south. The beacon mentioned earlier as having operated since spring 1955 had been following the drift of the Fram (northwesterly) since May 1955, but in mid-June 1956 it also began to move south from the 84th parallel and is now located south of the 81st parallel. (6)



Oceanographic Expedition in Arctic

The diesel-electric ship Ob' is now in the high latitudes of the Arctic Ocean carrying out an oceanographic expedition of the Arctic Scientific Research Institute. The expedition also includes workers from the Zoological Institute and Microbiological Institute of the Academy of Sciences USSR, and the State Astronomical Institute imeni P. K. Shternberg.

On this voyage, the Ob' is under the command of Captain Nikolay Fedorovich Inyushkin, who was aboard the Lena on its voyage to the Antarctic. His present crew includes the following men who also made the trip to the Antarctic last year: N. Sviridov, chief mate; B. Chirkov, chief electrical engineer; V. Kaynov, second assistant engineer; A. Nezgovorov, chief radioman; P. Tsvetkov, boatswain; and N. Afim'in, seaman.

Other participants in the expedition, including expedition chief L. Balakshin, geographer Ya. Gakkel', biologist P. Gavrilov, and hydrochemist Ye. Belysheva, have taken part in many similar trips to the north.

The scientific part of the expedition is under the direction of Ya. Gakkel'. One of the basic tasks of this scientific group is the study of water and heat exchange between the Arctic, Atlantic, and Pacific oceans. Connected with this problem is the question of atmospheric processes and ice cover in the Arctic Ocean, which affect Europe and Asia and consequently the Northern Sea Route. For this question, observations are being made in the northern part of the Greenland Sea.

The work program this year includes research to the north of Spitsbergen and Zemlya Frantsa-Iosifa, where the warm Spitsbergen and the cold East Greenland currents will be studied, in addition to research on relief and geological structure of the ocean bottom in the area of the so-called Nansen threshold.

The program of the Ob' includes removal of a group of polar workers from the drift station Severnyy Polyus-5 for return to the mainland.

After leaving Leningrad, the Ob' stopped in Stockholm, where Swedish scientists, Walter Schytt and Erik Eriksson, and a Norwegian, Joergen Shumacher, joined the expedition.

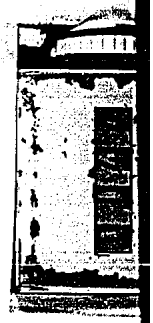
The first hydrologic traverse was completed along the 78th parallel of latitude. Despite the ice moving down from the north, the ship crossed the entire Greenland Sea along this parallel.

A group of synoptocists under the direction of Rogozin have provided the expedition with regular weather forecasts.

In late August, the ship was proceeding to the unstudied northwestern part of the Greenland Sea. On the night of 28 August, the Ob' was connected by radiotelephone with the Antarctic station Mirnyy. A 30-minute conversation was held, though the two points were 20,000 kilometers apart. (7)

The Ob' is carrying a large group of students from the Higher Marine Engineering School imeni S. O. Makarov, the geographic school of the Leningrad State University, and the Hydrometeorological Institute.

The expedition will return to the USSR in October. (8)



Arctic Institute Low-Temperature Laboratory

Workers of the low-temperature laboratory at the Arctic Institute use test chambers and a large test basin to carry out their ice research. The test basin is kept frozen and small ship models are placed in it to study icebreaker operation. Studies on the ice itself are also carried out there.

The laboratory is directed by Doctor of Geographic Sciences I. S. Peshchanskiy and Engr A. A. Yakovlev. Workers at the laboratory extend their work in the test basin to the Arctic itself. Laboratory workers I. G. Petrov, G. N. Yakovlev, Yu. D. Nazintsev, and N. V. Cherepanov are now working at Severnyy Polyus-4, studying the thermal regime and structure of the ice cover and other questions. (9)

Geophysical Expedition Departs for Arctic

The first group of an expedition from the Main Geophysical Observatory imeni A. I. Voyeykov departed for Severnyy Polyus-4 from Moscow on 6 July. Organized under the direction of Prof D. L. Laykhtman, the expedition has been provided with some new equipment built at the observatory. This includes so-called underwater pyranometers for measuring radiation in the ice and in the water below and special installations with photo-registers which will permit automatic temperature determinations at various levels. (10)

The group flew north in Polar Aviation aircraft SSSR N-443 with a crew composed of N. Samusev, pilot; A. Strel'tsov, copilot; G. Mal'yan, navigator; A. Glybin, flight engineer; and A. Vorob'yev, radioman.

In addition to carrying the expedition members, the plane delivered cargo to both Severnyy Polyus-4 and Severnyy Polyus-5, reaching the Arctic Basin by way of Leningrad, Arkhangel'sk, and Ostrov Dikson. (11)

Ice Survey and Escort Flights

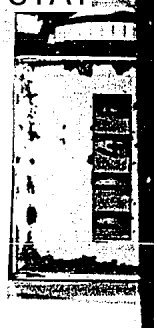
An IL-12 aircraft piloted by I. G. Bakhtinov left Moscow for the Arctic on 15 June. This was the first of a group of aircraft assigned the task of doing ice survey in the Kara Sea and then proceeding to the western Arctic to aid the first ship convoys sailing along the Northern Sea Route from west to east. (12)

Arctic Tour Completed by Soviet Children

A group of school children has returned to Moscow after completing a tour through the Soviet Arctic. The children sailed through the White, Barents, and Kara seas and visited Arkhangel'sk, Khabarovo, Amderma, Ust'-Kara, Ostrov Belyy, and Ostrov Dikson. (7)

ANTARCTIC

Preparations were made during the summer for a new Soviet expedition to the Antarctic which will leave the USSR this fall. In addition to the Main Administration of the Northern Sea Route, many institutes of the Academy of Sciences USSR, the Central Aerological Observatory, the Central Forecasting Institute, and many other scientific organizations took part in these preparations.



The continental component of this expedition will be under the direction of A. F. Treshnikov. (14)

Activities at Mirnyy and Pionerskaya

In accordance with decisions of the Scientific Council on Antarctic Research of the Academy of Sciences USSR, supplementary research has already begun at Mirnyy with the dispatch of four parties from the base camp. In early August, these parties began observations from four temporary stations built on a line perpendicular to the shore and following the 93d meridian, on which Mirnyy is located.

The first of these stations was set up on the ice plateau, 85 kilometers from Mirnyy at an altitude of 600 meters above sea level. This station was manned by meteorologist V. Babarykin and aerial photographer N. Malyutin.

The second station was organized on the plateau also, but at a distance of 10 kilometers from Mirnyy at an elevation of 400 meters. Observations were made at this base by aerial navigator V. Tulin and helicopter commander N. Shonin.

The third station was set up on fast ice of the Davis Sea, 14 kilometers from shore. Magnitologist M. Pogrebnikov, radioman A. Chel'shev, and Izvestiya correspondent O. Stroganov lived in a portable hut at this camp.

The fourth station was built on the coast, 5 kilometers to the west of Mirnyy, almost at the very edge of the ice barrier. Geologist P. Voronov and helicopter commander I. Inozemtsev were stationed at this camp to make studies on coastal winds in the area. (1)

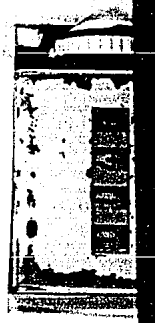
All of these stations, with the exception of the one on the ice of Davis Sea, were reported to have ceased operations by the end of August. Additional research by parties operating out of Mirnyy included studies made on the Haswell Islands by geologist Voronov and Ye. Korotkevich (director of the geography-geology detachment) and two flights made to the Banger oasis lying 370 kilometers east of Mirnyy. During the tractor push into the interior which established Pionerskaya, aerologists V. Babarykin and A. Shchekin carried out extensive studies on the upper atmospheric layers.

Basic research has continued at Mirnyy at the various well-equipped scientific units. These include a first-class aerometeorological station housed in a hut and two open areas, the main one of which is located 140 meters from the hut. Meteorologists relay information from this area to the hut by telephone.

Special self-recording instruments installed at the station register all changes in pressure, temperature, and humidity, speed and direction of winds, and heat reaching the earth's surface directly from the sun and from the atmosphere. Reflected heat and over-all heat balance are also measured.

A Surazhskiy anemograph has been set up at the observatory and records on film the slightest change in wind speed, the mean wind speed, and the intensity of all gusts. The instruments of this installation are located on a mast at various heights, making it possible to measure wind speed and air temperature throughout the 10-meter air layer adjacent to the earth's surface.

Workers at the station also gather data on clouds. Directing a beam of light vertically upward by means of a special projector, a light spot can be thrown on low clouds, and with the aid of a goniometer the height of these clouds can be determined.



Since the composition of Antarctic air is of interest, the station gathers air samples in special flasks twice a month for subsequent analysis in the laboratory. Radiosondes are launched every morning and evening, and in addition to the information transmitted by the equipment itself, wind direction and velocity aloft is determined by tracking the path of the radiosonde with radar.

The ionospheric station at Mirnyy is completely automatic, with reflections from various layers of the ionosphere appearing on a cathode tube from which they are automatically photographed. The station can register the characteristics of all air layers between 100 and 1,000 meters.

The ionospheric station is under the direction of G. Bukin.

Mirnyy also has apparatus for round-the-clock registration of earthquakes, the installation being manned by seismologists A. Sytinskiy and L. Polikarpov.

Magnitologist P. Sen'ko, who accompanied the tractor expedition from Mirnyy into the interior, carried out an interesting series of magnetic observations that indicate existing charts are as much as 10 degrees in error in giving magnetic deviation.

Pionerskaya, the interior station which began operations on 27 May, is continuing to operate. Average air temperature during the station's first month of existence was about 40 degrees below zero, and in early July an interesting temperature differential developed between Mirnyy and Pionerskaya. On 5 July, the temperature at Mirnyy was minus 38.5 degrees, while at Pionerskaya the thermometer showed minus 64 degrees. In the first half of July, the mean temperature at Pionerskaya was minus 50 degrees.

On 20 August, a new absolute minimum temperature for Antarctica was recorded at the station -- minus 66.8 degrees. The temperature was minus 67.7 at the snow surface.

Several flights were made to Pionerskaya from Mirnyy during the Antarctic winter to deliver supplies and personnel. (15) These included a flight completed on 7 June by two IL-12 aircraft. (16)

The air detachment at Mirnyy includes the following personnel:

Pilots -- G. Sorokin, N. Polyakov, A. Kash

Navigators -- V. Tulin, M. Kirillov

Flight engineers -- A. Zaytsev, V. Myakinkin, A. Mokhov, M. Chagin

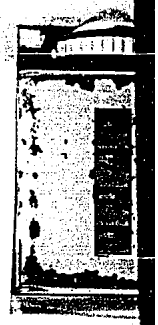
Radiomen -- G. Patarushin, A. Chelyshev, V. Men'shikov

Helicopter pilots -- I. Inozemtsev, N. Shonin, F. Manylov, S. Osadchiy

Airfield workers -- I. Shmandin, M. Akent'yev, V. Romanov, V. Ganyushkin (15)

Film in Preparation

Vladimir Yeshurin returned to the USSR aboard the Lena with 18,000 meters of exposed film taken in the south polar regions by him and Aleksandr Kochetkov, who accompanied the Ob' on its trip south. Using this footage, the Central Studio of Documentary Films is preparing a major documentary film dealing with the Soviet antarctic expedition. (13)



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